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IS 5035 (1969): Sterilizers, Bowl and Utensil (Pedal Type)  
[MHD 12: Hospital Equipment]



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*Indian Standard*

SPECIFICATION FOR  
STERILIZERS, BOWL AND UTENSIL  
(PEDAL TYPE)

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**BUREAU OF INDIAN STANDARDS**  
**MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG**  
**NEW DELHI 110002**

# *Indian Standard*

## SPECIFICATION FOR STERILIZERS, BOWL AND UTENSIL ( PEDAL TYPE )

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# *Indian Standard*

## SPECIFICATION FOR STERILIZERS, BOWL AND UTENSIL (PEDAL TYPE)

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 28 March 1969, after the draft finalized by the Hospital Equipment Sectional Committee had been approved by the Consumer Products Division Council.

**0.2** The formulation of Indian Standards on hospital equipment has been taken up at the instance of the Advisory Committee for the Development of Surgical Instruments, Equipment and Appliances, Government of India.

**0.3** This standard forms one of a series of Indian Standards on hospital equipment. Other specifications in the series are :

IS:3118-1965 Electric bacteriological incubators

IS:3119-1965 Hot air sterilizers

IS:3120-1965 Baby incubators

IS:3829-1966 Horizontal-cylindrical and horizontal rectangular steam sterilizers, pressure type (for hospital use)

IS:3830-1966 Water stills for pyrogen-free distilled water

IS:3831-1966 Dressing drums

IS:4510-1968 Sterilizers, steam, horizontal cylindrical high speed, pressure type

IS:5022-1969 Sterilizers, instrument (table model)

**0.4** This standard contains clauses which permit the purchaser to use his option for selection to suit his requirements. The relevant clauses are **3.1, 7.1.4, 8.0, 8.2, 8.2.2, 8.3** and **12.1**.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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\*Rules for rounding off numerical values (*revised*).

## 1. SCOPE

1.1 This standard covers structural and functional requirements of boiling type sterilizers for sterilizing such articles as different types of bowls and utensils used in clinics and hospitals.

1.2 Only the sterilizers which are not used in the vicinity of anæsthetic gases come under the purview of this standard.

## 2. TERMINOLOGY

2.1 For the purpose of this standard, the sterilizer shall mean an appliance used for the destruction of certain bacteria and related organisms by boiling water.

## 3. DESIGN

3.1 The sterilizer shall consist of a shell, having a pedal-operated lid at the upper end. It shall be designed to operate on electricity, steam from a central source, gas, or kerosene, either independently or in combination, as desired by the purchaser.

## 4. DIMENSIONS

4.1 The nominal inside dimensions of the shell shall be as given below in Table 1, subject to a tolerance of  $\pm 2$  percent.

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**TABLE 1 INTERNAL DIMENSIONS OF STERILIZER SHELL**

All dimensions in millimetres.

| SIZE No. | LENGTH | WIDTH | DEPTH* |
|----------|--------|-------|--------|
| 1        | 460    | 360   | 380    |
| 2        | 560    | 410   | 480    |
| 3        | 610    | 460   | 300    |
| 4        | 610    | 500   | 500    |
| 5        | 660    | 460   | 480    |
| 6        | 760    | 500   | 480    |

\*The depth of the shell shall be considered from the rim to a false bottom if one is provided, or to the tray rest if a false bottom is not provided when the sterilizer is electricity operated. In the case of steam, gas, or kerosene operated sterilizers, it shall be the rim to bottom plate distance.

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## 5. MATERIALS

**5.1 Shell, Bottom Lid and Tray** — These shall be manufactured from the following:

| <i>Material</i>                            | <i>Thickness</i><br>mm | <i>Conforming to</i>                                 |
|--|------------------------|--|
| Stainless steel sheet                      | 1.25                   | Designation 04Cr19Ni9 of schedule V of IS:1570-1961* |
| Brass sheet, $\frac{1}{2}$ hard condition  | 2.00                   | IS:410-1967†   |
| Copper sheet, $\frac{1}{2}$ hard condition | 2.00                   | IS:1972-1961‡  |

## 6. CONSTRUCTION

**6.1 Shell** — The construction of the shell shall be in accordance with the best practice and the seams shall be either argon-arc welded or brazed (depending on the selection of the parent metal), or folded and soldered. The rim shall be adequately stiffened. The vertical corners of the sterilizers shall be of any suitable radius but in any case not less than 13 mm.

**6.2 Lid** — This may be either plain or dished, but in any case it shall not buckle, warp, or twist permanently with load. It shall be of the same material as the shell, and corners shall be rounded to suit those of the shells. It shall have flaps which shall restrict the condensate within the shell only even at the maximum opening of the lid. A provision shall be made to connect the link end of the pedal mechanism meant to open and close the lid. In Sizes 1, 2 and 3 (*see Table 1*), the lid shall open fully by the single press of the pedal mechanism and in other sizes by two or more presses of the pedal. However, in all the sizes, the lid shall open to 80° to 85° from its closed position.

**6.2.1** Connected to the lid shall be such a mechanism that when the lid is open, a bracket or rest for the bowl and utensil tray shall bring the tray well out of the water even when the water is at the overflow level. The tray bottom shall be perforated to allow easy drain-out or entrance of the water when the tray is being lifted or lowered in the sterilizer. Handles shall be provided for handling the tray and the tray shall be convenient for fitting in or removal from the sterilizer. When the tray is loaded as given

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\*Schedules for wrought steels for general engineering purposes.

†Specification for rolled brass sheet, strip and foil (*second revision*).

‡Specification for copper plate, sheet and strip for industrial purposes.

below, with the load distributed uniformly, the lid shall close slowly and without a bang:

| <i>Size No.</i> | <i>Load in Tray</i><br>kg |
|-----------------|---------------------------|
| 1               | 8                         |
| 2               | 10                        |
| 3               | 12                        |
| 4               | 16                        |
| 5               | 18                        |

**6.2.2** Material of the tray shall be the same as that of the shell and of such a design so as to take the full load of the utensils and bowls without any buckling or twisting. The vertical corners of the tray shall in any case be not less than 13 mm radius.

**6.3 Stand**—This shall be such in construction that it will withstand normal abuse in handling and transit without any damage to it. Its height shall be such that the overall sterilizer height shall be restricted to a convenient working height of not less than 1 070 mm. Provisions or permanent fittings or both on the stand to adapt the device for opening the lid with a pedal shall be so located that the maximum height of the pedals when fitted on shall be not more than 380 mm from the ground. A provision shall also be made to level the stand and eliminate any shake or wobble.

**6.3.1** In case of electricity operated sterilizers, the stand design shall provide for the adaption of the control box. For steam, gas, or kerosene operated sterilizers the stand design shall be such that no damage shall be observed on the stand even after 8 hours of continuous use.

## 7. FUNCTIONAL REQUIREMENTS

**7.1** The sterilizer shall have a provision for the water inlet supply, and so designed that under no circumstances will there be a head of water in the sterilizer other than its maximum water level. The inlet orifice shall be such that it will not splash any water when filling up. A valve-cock shall be provided to cut off the water supply when desired. In order to prevent any possibility of the water-level rising beyond the maximum and flowing over the rim of the sterilizer, a suitable overflow to drain shall be provided.

**7.1.1** A drain-out connection shall be provided with a valve-cock to facilitate draining of the sterilizer when desired.

**7.1.2** Between any outlet of the sterilizer and the common drain pipe, there shall be an air gap.

**7.1.3** The tap handles and knobs shall be of an insulating material.

**7.1.4** The sterilizer, if operated upon gas, kerosene, steam and electricity without thermostat shall be set at 100°C at sea level. It may, when operated upon electricity, be provided at the option of the purchaser with a thermostat in which case it shall be set at 99°C at sea level.

## 8. METHODS OF OPERATIONS OF STERILIZERS

**8.0** Sterilizers shall be capable of operation on one of the sources given in **8.1** to **8.4** as selected by the purchaser and shall satisfy the requirements specified therein.

**8.1 Electric Operation** — Electrically-operated sterilizers shall have a 3-phase 4-wire supply and the loading shall be as follows:

| <i>Size</i><br>mm | <i>Loading</i><br>kw |
|-------------------|----------------------|
| 460 × 360 × 380   | 4.5                  |
| 560 × 410 × 480   | 6.0                  |
| 610 × 460 × 300   | 6.0                  |
| 610 × 500 × 500   | 9.0                  |
| 660 × 460 × 480   | 9.0                  |
| 760 × 500 × 480   | 12.0                 |

An indicator lamp shall be provided on the sterilizers to indicate by glowing when the instrument is 'ON'. The electrical circuit shall have a device to disconnect the heaters from the supply in case of water level falling low or boiling dry. The entire electrical circuit shall be insulated from the sterilizer and the insulation resistance shall not be less than 10 MΩ. It shall also be capable of standing a high voltage test of 1.5 kV rms for 1 minute between any point of supply and earth.

**8.1.1** A positive connection for earth shall be provided and distinctly marked.

**8.1.2** Only tubular type immersion heaters (commonly used in kettles) shall be employed for the purpose.

**8.1.3** The wires used shall be heat resistant and the wiring shall be neatly laid out.

**8.2 Direct Steam Operation** — The steam shall be supplied to the sterilizer at inlet steam pressure of 3 kgf/cm<sup>2</sup>. The sterilizer shall be fitted with a steam-trap and strainer. The strainer may be combined with the steam trap. At the option of the purchaser, the sterilizer may be provided with a safety valve, pressure gauge, pressure reducing valve and stop cock.

**8.2.1** The steam valve shall be tested to 5 times the working pressure and shall be provided to control the steam supply to the coils and its handle shall be insulated. The steam coils shall be of dull nickel plated copper and adequately supported. They shall be designed to stand a

hydraulic test of twice the working pressure on completion and the coils shall have no appreciable flats or kinks.

**8.2.2** At the option of the purchaser, a temperature controlling device may be provided so as to control the steam supply and maintain the water temperature.

**8.3 Gas Operation** — This shall be accomplished by providing suitable gas burners underneath. At the option of the purchaser, a temperature controlling device may be provided so as to control the gas flame and maintain the water temperature.

**8.4 Kerosene Operation** — In this case suitable oil pressure stove or oil pressure heater shall be provided underneath. The oil pressure stoves and oil pressure heaters shall also satisfy the requirements specified in IS:1342-1964\* and IS:2787-1964† respectively.

## 9. FINISH

**9.1** All stainless steel parts shall have a finish not inferior to satin finish.

**9.2** All brass and copper parts shall be plated chromium over nickel according to Service Grade No. 2 of IS:4827-1968‡.

**9.3** Parts to be painted shall be de-greased, rust-proofed by phosphating and suitably protected by an anti-corrosive primer, and then painted either by brushing or by spraying in stove enamel or air drying enamel of the specified shade. In every instance each coat shall be separately stoved or air dried as the case may be. The resulting finish shall be hard and shall not readily chip or flake.

**9.4** Welding shall fully penetrate and shall be sound in every detail and it shall be finished flush in the finished stage. There shall be no exposed sharp edges or other unsealed formations which may harbour dirt or foreign matter.

## 10. MARKING

**10.1** The sterilizers shall be legibly and indelibly marked with the following:

- a) Identification of the manufacturer;
- b) Wattage, voltage, phase and cycle in case of electrically operated sterilizers;
- c) Code and serial number;

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\*Specification for oil pressure stoves ( revised ).

†Specification for oil pressure heaters.

‡Specification for electroplated coatings of nickel and chromium on copper and copper alloys.

- d) Maximum working pressure in case of direct steam-operated sterilizers; and
- e) The legend 'NOT TO BE USED IN ANÆSTHETIZING SITES'.

**10.1.1** The sterilizers may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## **11. OPERATING MANUAL**

**11.1** Each sterilizer shall be accompanied by an operating manual which shall contain the following information :

- a) Instructions and directions for installation of the sterilizer,
- b) Operation of the sterilizer, and
- c) Routine maintenance and service.

## **12. PACKING**

**12.1** The sterilizers shall be packed as agreed to between the manufacturer and the purchaser.

# INDIAN STANDARDS

## ON

### Hospital Equipment

| IS:         |   |     |     |     |     | Rs   |
|-------------|---|-----|-----|-----|-----|------|
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| 4036 - 1967 | Trolleys, patient                           | ... | ... | ... | ... | 2-00 |
| 4037 - 1967 | Stretchers and stretcher carriers           | ... | ... | ... | ... | 2-50 |
| 4266 - 1967 | Lockers, bedside for hospital use           | ... | ... | ... | ... | 2-60 |
| 4267 - 1967 | Stands, wash hand basin                     | ... | ... | ... | ... | 2-50 |
| 4455 - 1967 | Trolleys, soiled linen                      | ... | ... | ... | ... | 2-00 |
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